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- A hand-drawn diagram of a simple circuit. It consists of a battery (represented by two cells), a switch, and a bulb connected in a loop.

1. The first step is to identify the problem. This involves understanding the current situation and what needs to be changed.

- KNOWN
TiO₂
(pg 7, ln 24+)

4. A nuclear power plant system comprising:
a nuclear reactor;
a steam turbine that uses steam generated in a pressure vessel included in the nuclear reactor; and
a radioactive material separating and removing apparatus placed in a reactor water system attached to the nuclear reactor, the pressure vessel or a steam passage extended between the pressure vessel and an inlet of the steam turbine and employing a metal or a metal oxide, which is stable in an environment in which high-temperature water or high-temperature steam exists, as an ion-exchange material that exchanges ions for radioactive ions.

10. The nuclear power plant system according to claim 4,

wherein the high-temperature water purifying apparatus includes a dryer disposed in the pressure vessel,

the dryer is provided with a plurality of corrugated plates defining spaces through which a multiphase flow containing radioactive materials flows, and a means for creating an electric field or a magnetic field between adjacent corrugated plates, and

minute radioactive particles contained in the multiphase flow are biased toward the corrugated plates by the electric field or the magnetic field.

11. The nuclear power plant system according to claim 9, wherein the means for creating an electric field or a magnetic field between the adjacent corrugated plates is powered by a photocell formed of:

the n-type semiconductor, which is TiO_2 or ZrO_2 , deposited on the corrugated plates; and

a film of a corrosion product, which is a p-type semiconductor, produced by a corrosion of surfaces of the corrugated plates.

12. The nuclear power plant system according to claim 4, wherein the high-temperature water purifying apparatus includes a dryer disposed in the pressure vessel,

the dryer is provided with a plurality of corrugated plates defining spaces through which a multiphase flow containing radioactive materials flows, and

surfaces of the corrugated plates are coated with TiO_2 or ZrO_2 that serves as the ion-exchange material.

13. The nuclear power plant system according to claim 4, wherein the high-temperature water purifying apparatus comprises:

a vessel;

a hollow membrane pipe disposed in the vessel; and

filter aid particles arranged in any one of the following manners in which:

the particles are floating about an outer
circumferences of the hollow membrane pipe,

14. The nuclear power plant system according to claim 13, wherein the hollow membrane pipe has porous structures, and diameters of pores in an outer part of the hollow membrane pipe are smaller than those of pores in an inner part of the hollow membrane pipe.

15. The nuclear power plant system according to claim 13, wherein a strainer is disposed outside, inside or inside and outside of the hollow membrane pipe.

~~16.~~ The nuclear power plant system according to claim 13, wherein the filter aid particles comprise:

a ferrite oxide, ~~such as~~ hematite (Fe_2O_3), magnetite (Fe_3O_4) and nickel ferrite (NiFe_2O_4);

oxides containing TiO_2 or ZrO_2 as a principal component;

or

a metal or a composite material, for producing the oxide or the oxides, which contains Fe, Ni, Ti or Zr as a principal element.

~~17. The nuclear power plant system according to claim 13, wherein the hollow membrane pipe is formed of:~~

oxides containing nickel ferrite (NiFe_2O_4), TiO_2 or ZrO_2 , as a principal components; or

a metal or a composite material, for producing the oxide or the oxides, which contains Fe, Ni, Ti or

Zr as a principal element.

18. The nuclear power plant system according to claim 4 further comprising a filtering means that reduces an iron concentration of water to 0.1 ppb or below to suppress increase in differential pressure in the high-temperature water purifying apparatus due to deposition of particles of corrosion products.

19. A method of operating a nuclear power plant system having a nuclear reactor including a pressure vessel provided with a head spray, in order to lower temperature of the pressure vessel, said method comprising the steps of:

limiting range of scattering of water sprayed by the head spray;

decreasing size of water drops of the water sprayed by the head spray; and

controlling an amount of the water to be sprayed according to the amount of steam generated by heat generated after shutdown of the nuclear reactor.

20. A method of operating a nuclear power plant system having a nuclear reactor including a pressure vessel provided with a head spray, said method comprising the step of:

supplying water not containing any radioactive materials or water having a small radioactive material concentration and supplied from a condensate purifying apparatus or a condensate storage tank.